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**INTERIM REMEDIAL ACTION
OPERABLE UNIT 2
SOURCE AREA ST41
RECORD OF DECISION**

**ELMENDORF AIR FORCE BASE
ALASKA
JUNE 1992
FINAL**

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**ELMENDORF AIR FORCE BASE
ALASKA
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FINAL**

FINAL
DECLARATION STATEMENT
for
RECORD OF DECISION
ELMENDORF AIR FORCE BASE
ANCHORAGE, ALASKA
OPERABLE UNIT 2, SOURCE AREA ST41 - INTERIM REMEDIAL ACTION
JUNE 1992

SITE NAME AND LOCATION

Elmendorf Air Force Base
Operable Unit 2, Source Area ST41, Interim Remedial Action
Anchorage, Alaska

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected interim remedial action for Operable Unit 2, Source Area ST41 (Four-Million Gallon Hill) at Elmendorf Air Force Base, a National Priorities List site located in Anchorage, Alaska. The interim remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for this site and is summarized in the attached Decision Summary.

The State of Alaska concurs with, and the United States Environmental Protection Agency approves, the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This interim remedial action addresses contamination at one of seven operable units at Elmendorf Air Force Base. ST41 is one of two source areas in Operable Unit 2. This interim remedial action has been selected by the United States Air Force (USAF), the United States Environmental Protection Agency (USEPA), Region 10, and the Alaska Department of Environmental Conservation (ADEC). The purpose of this interim remedial action is to initiate recovery of product floating on the groundwater surface, which poses the principle threat to human health and the environment. This action will also reduce further movement of contaminated groundwater through containment of the seeps, thus eliminating a pathway of contamination to humans, wildlife, and plants from surface water and groundwater. The interim remedy is expected to be consistent with the final remedy that will be selected for Operable Unit 2 following completion of the remedial investigation/feasibility study.

The major components of the selected remedy include:

- Extraction of fuel product from the groundwater surface in the shallow aquifer to minimize further migration;
- Containment of seeps using collection systems and subsequent product recycling and water treatment;
- Treatment of the collected water by an air stripping process to meet federal, state, and local regulations;
- Treatment of the emissions from the air stripping process to meet state regulations and permit requirements;
- Disposal of the treated groundwater in accordance with federal, state, and local regulations by discharge to the municipal wastewater system; and
- Monitoring of the effectiveness of the groundwater containment and treatment process to provide design information for the final remedy.

DECLARATION OF STATUTORY DETERMINATIONS

This interim remedial action is protective of human health and the environment, complies with federal and state applicable or relevant and appropriate requirements for this limited-scope action, and is cost-effective. Although this interim remedial action is not intended to fully address the statutory mandate for permanence and treatment to the maximum extent practicable, this interim remedial action does utilize treatment and thus is in furtherance of that statutory mandate. Because this action does not constitute the final remedy for the operable unit, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as the principal element, although partially addressed in this remedy, will be addressed by the final response action. Subsequent actions may be necessary to fully address the principal threats posed by the conditions at this operable unit.

Because this remedy will result in hazardous substances remaining on site above health-based levels, the effectiveness of the interim action as a final action will be evaluated in the Operable Unit 2 remedial investigation/feasibility study and reviewed within five years of the initiation of the remedial action.

SIGNATURES

United States Air Force

Date

Approval

Date

Regional Administrator, Region 10
United States Environmental Protection Agency

Signature sheet for the foregoing Operable Unit 2, Source Area ST41, Elmendorf Air Force Base Interim Remedial Action, Record of Decision between the United States Air Force and the United States Environmental Protection Agency, Region 10, with concurrence by the Alaska Department of Environmental Conservation.

Concurrence

Date

Alaska Department of Environmental Conservation

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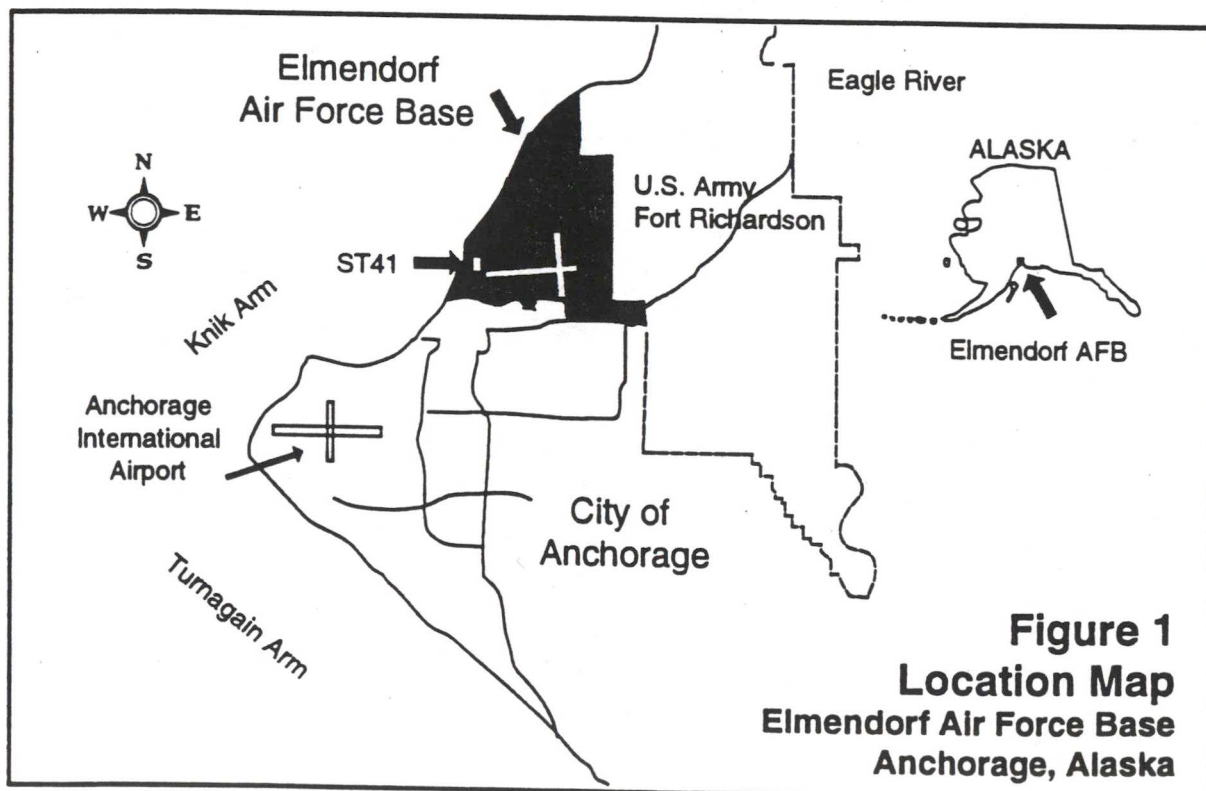
ATTACHMENT A Community Relations Activities at Elmendorf AFB

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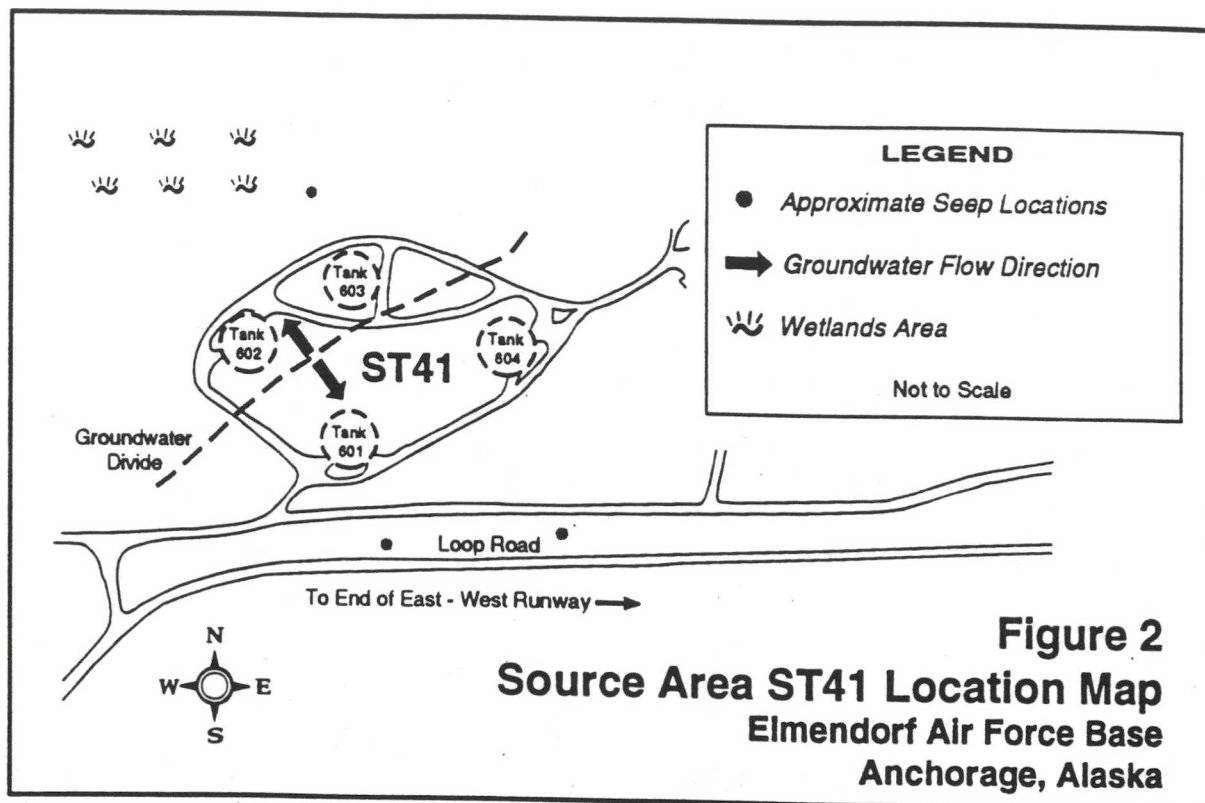
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1.0 SITE NAME, LOCATION, AND DESCRIPTION

Elmendorf Air Force Base (AFB), a National Priorities List (NPL) site, is located within the northern border of the Municipality of Anchorage, Alaska. The base is bordered on the east by the U.S. Army's Fort Richardson, on the south by the city of Anchorage, and on the north and west by the Knik Arm of Cook Inlet (Figure 1). The base encompasses approximately 13,130 acres, of which 7,077 acres are essentially undeveloped. Wetlands, lakes, and ponds cover approximately 1,416 acres. The approximately 6,053 acres remaining have been developed for airfield operations, base support operations, personnel housing, and recreational facilities. The base population is approximately 8,600 military personnel and dependents. Approximately 6,100 military personnel and 1,600 civilians work on base.



The interim remedial action for Operable Unit 2 (OU2) will occur at Source Area ST41 (ST41), also known as Four-Million Gallon Hill. ST41 is approximately 20 acres in size and is located near the western edge of the base, north of Loop Road, west of Brown Road, and approximately 2,200 feet east of the Knik Arm of Cook Inlet (Figure 2).



ST41 includes four one-million gallon, JP-4 fuel, underground storage tanks and ancillary piping constructed in the early 1940s. Reports indicate that the tanks are steel and may have an outer concrete lining. ST41 also includes an area of approximately one acre located west of the tanks which is described as a tank sludge burial area. The sludge burial area will be investigated in the ongoing remedial investigation/feasibility study (RI/FS) for OU2.

ST41 is situated on the glacially deposited Elmendorf Moraine. Elevations range from 225 to 275 feet above mean sea level on the northeast-southwest trending moraine. Groundwater levels range from approximately 34 feet below ground surface on top of the moraine, to less than one foot below ground surface north and south of the moraine. Groundwater seeps are evident along the south side of the moraine. A similar seep is located on the north side of the moraine, where shallow groundwater is discharging to a wetlands area.

ST41 is located about 1,000 feet from the west end of the base airfield. Land in the vicinity of ST41 is basically undeveloped except for an abandoned underground tank complex to the east. Residences and residential support services occupy much of the southwest corner of the base about one-half mile south of ST41. Approximately one and one-half miles south of ST41, and just beyond the Government Hill Gate at the southwest corner of the base, is an Anchorage residential area commonly referred to as Government Hill. Industrial land uses beyond the southwest boundary of the base include railroad yards, a fuel storage tank farm, and marine facilities.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 History of Operations

Since installation in the early 1940s, the four tanks at ST41 reportedly have been subject to numerous leaks and above-ground spills totaling several hundred thousand gallons.

In the 1970s, an oil/water separator was installed in response to fuel seeping out of the south side of the Elmendorf moraine, north of Loop Road. During an inspection in May 1983, an additional fuel seep on the south side was discovered. In 1989, a concrete dam was installed in an effort to recover fuel from the south seeps. During RI/FS work in 1991, a fuel seep was discovered on the north side of the Elmendorf moraine, discharging into a wetlands area.

Fuel product has been observed floating on the groundwater in monitoring wells located downgradient of the tanks. Leak tests conducted in late 1990 indicated that all four tanks and piping were leaking. In January 1991, the tanks and piping were pumped dry and taken out of service.

Fuel-related contaminants, including benzene, have been detected in the groundwater and seeps downgradient of the tanks at levels above the maximum contaminant levels (MCLs) established by the Safe Drinking Water Act (Table 1).

TABLE 1
GROUNDWATER/SURFACE WATER SAMPLING RESULTS

Type	Contaminant	Concentration (Range)	Standard
Groundwater	Benzene	10.0 to 15,000.0	5.0 MCL*
Surface Water	Benzene	400.0	5.0 AWQS**

All values in micrograms per liter.

*MCL - Maximum Contaminant Level.

**AWQS- Alaska Water Quality Standards.

2.2 History of Site Investigations

In 1983, the USAF began studies of Elmendorf AFB through its Installation Restoration Program (IRP). Source Area ST41 was identified through a records search conducted in 1983 which indicated that numerous leaks and above-ground fuel spills had occurred since the tanks were installed in the 1940s. Two groundwater monitoring wells were installed downgradient of the seeps in 1984. Analytical results of groundwater samples indicated no water quality problems downgradient of the seeps.

Remedial investigation activities performed in 1988 and 1989 included the drilling of twenty-six borings, seventeen of which were completed as monitoring wells. Two test trenches were dug on the south side of the moraine, a terrain conductivity survey was conducted in the tank sludge burial area, and soil-gas samples were collected. Results of the investigation indicated that the soil and water samples collected at the site were contaminated with fuel and with the soluble components of fuel.

In August 1990 and May 1991, additional investigative activities were conducted including collection of surface water (seep) samples, subsurface soil samples, groundwater probe samples, and product probe samples; installation of nine monitoring wells; and sampling of monitoring wells. Evaluation of the data from these sampling efforts serves as the basis for this interim action.

Groundwater data indicate that groundwater within an approximate 500-foot radius around ST41 is contaminated and floating product exists downgradient of both the north and south tanks. In addition, soil and surface water contamination exist at ST41.

2.3 History of Enforcement Actions

In 1989, Elmendorf AFB was proposed for placement on the NPL. The facility was placed on the NPL in August 1990. A Federal Facilities Agreement (FFA) for Elmendorf AFB was signed on November 14, 1991 by the USAF, USEPA, and ADEC. The FFA documents and facilitates cooperation and information exchange between the USAF, USEPA and ADEC during development, implementation, and monitoring of appropriate response actions at the base. These actions must be in accordance with CERCLA and the NCP. The FFA also establishes requirements for the performance of remedial investigations and interim remedial actions at the base, including ST41.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Prior to conducting community relations activities for ST41, a public workshop was held to discuss the various environmental cleanup programs underway at Elmendorf AFB. On January 28, 1992, the date and location of the workshop were advertised in the Anchorage *Daily News* and Anchorage *Times*. On January 29, 1992, the Air Force issued a press release announcing the public workshop which was held on February 5, 1992 at the Government Hill Elementary School. Approximately 75 individuals attended the workshop.

The Proposed Plan for ST41 was released to the public for comment on February 17, 1992. The document was mailed to approximately 240 individuals on the Elmendorf AFB mailing list. This document was also made available to the public in the administrative record maintained in Anchorage at the Bureau of Land Management's Alaska Resources Library and at the Consortium Library of the University of Alaska at Anchorage. A notice of the public comment period and the availability of this document was published in the Elmendorf AFB newspaper, the *Sourdough Sentinel*, on February 13, 1992, and in the Anchorage *Times* and the Anchorage *Daily News* on February 16, 1992. A public comment period on the Proposed Plan was held from February 17, 1992 to March 17, 1992.

A public meeting was held on February 27, 1992 at the Wilda Marston Theater at the Z.J. Loussac Library in Anchorage to present the Proposed Plan. Approximately 30 individuals attended the public meeting. At this meeting, USAF, USEPA, and ADEC representatives discussed the project, answered questions, and received public comments. A verbatim transcript of the meeting was prepared by a court reporter. Written comment forms were distributed at the public meeting.

Seven sets of written comments were received during the public comment period. Responses to the comments received during the public comment period and at the public meeting are included in the Responsiveness Summary, which is Part III of this Record of Decision (ROD).

In February 1992, the first issue of *Environmental Update*, a quarterly newsletter aimed at keeping the public informed of the status of environmental cleanup programs at Elmendorf AFB, was distributed to workshop attendees and individuals on the mailing list. The second issue of *Environmental Update* was distributed in May 1992 to individuals on the mailing list.

4.0 SCOPE AND ROLE OF OPERABLE UNIT AND RESPONSE ACTION

Operable Unit 2, which contains ST41, is one of seven operable units comprised of 32 known and/or suspected hazardous waste sites located at Elmendorf AFB. Existing site characterization data indicated OU2 source areas presented substantial threats to human health and the environment. This ROD for OU2 addresses the first interim remedial action at Elmendorf AFB.

The interim remedial action is a measure to prevent the spread of fuel constituents, reduce the potential risk of impact to existing and future groundwater users located downgradient of the site, and initiate a strategy expected to be consistent with the final remedy. This action is limited to addressing floating product and seep contamination, whereas the final remedy will also consider groundwater and soil cleanup. The proposed interim action includes product extraction, containment of seeps, treatment of collected water, and disposal. These elements will likely become major components of the final remediation at the site.

5.0 SUMMARY OF SOURCE AREA CHARACTERISTICS

5.1 Geology and Hydrology

Geologic units of concern at and near ST41 include the Elmendorf Moraine, the Anchorage Plain alluvium, the Bootlegger Cove Formation, and unnamed sediments that underlie the Bootlegger Cove Formation.

ST41 is situated on the glacially deposited Elmendorf Moraine. The moraine consists of laterally and vertically discontinuous, unconsolidated, glacial till with poorly sorted boulders, gravel, sand, silt, and clay. The Bootlegger Cove Formation, a low permeability clay layer, is believed to underlie ST41, although the borings to date have not been drilled deep enough to confirm this.

The Anchorage Plain alluvium, often called the outwash plain, is present approximately one-quarter mile south of the Elmendorf Moraine. The deposits of this unit are characterized by gravel and sand with minor amounts of silt. In general, the outwash plain deposits mantle the base from Ship Creek to the Elmendorf Moraine. These deposits are underlain at variable depth by the Bootlegger Cove Formation, which in turn is underlain by unnamed sediments similar to the outwash plain sediments. The stratigraphic relationship of the sediments of the outwash plain to the Elmendorf Moraine at ST41 is currently unknown.

Groundwater is present in all four of the geologic units described above. However, significant quantities of water are only obtainable from the outwash plain deposits and the deposits which underlie the Bootlegger Cove Formation. The shallow water table aquifer

of the outwash plain is believed to be separated from a deeper confined aquifer in the unnamed sediments by the Bootlegger Cove Formation. This clay layer is expected to act as a barrier that significantly retards movement of groundwater and contaminants between these aquifers.

At ST41, groundwater is found in the sediments of the Elmendorf Moraine. Because of the lateral and vertical heterogeneity of these deposits, groundwater is typically found in perched systems and is in greatest abundance in sand and gravel lenses within the moraine. Evidence of perched groundwater is indicated by the presence of groundwater seeps along the south and north sides of the moraine.

Groundwater level measurements in existing monitoring wells at ST41 indicate that a groundwater divide is present at the crestline of the moraine. In general, groundwater on the north side of ST41 flow northwest and groundwater on the south side of the moraine flows southeast. Water levels at ST41 are highly variable, ranging from 34 feet below ground surface on top of the moraine to approximately one foot below ground surface south of the moraine.

The hydraulic interaction between groundwater found in the Elmendorf Moraine sediments at ST41, the shallow water table aquifer, and the deeper confined aquifer is not fully understood. Numerous borings and monitoring wells have been drilled on and around ST41. However, the depth of these borings was insufficient to determine and characterize the hydrogeologic environment below ST41.

As part of ongoing RI activities, borings will be drilled at and near ST41 to more fully characterize the geologic and hydrogeologic environment. This effort will provide information useful in understanding and defining the potential for contaminant migration to the shallow water table aquifer and the deeper confined aquifer.

No Elmendorf AFB supply wells in the immediate vicinity of ST41 obtain water from the shallow groundwater aquifer. In general, the deeper confined aquifer at Elmendorf AFB serves currently only as a stand-by water supply when surface water supplies cannot meet demand. The area surrounding Elmendorf AFB uses surface water for various services, including industrial, commercial, domestic, and public supply. The nearest wells using the shallow aquifer are private water wells located in the Government Hill residential area south of and adjacent to the base. These wells are located over one and one-half miles away and not directly downgradient of the site; thus, the wells are not expected to be in danger of contamination from ST41.

5.2 Sources and Types of Contaminants

The source of contamination at ST41 was periodic surface spills and subsurface leaks in the tanks. Leaking valves and pipes may also have contributed. The volume of fuel released is estimated to have been several hundred thousand gallons. The spills and subsurface leaks have resulted in fuel product floating on the groundwater and seeping from locations on the north and south sides of the hill. Dissolved constituents of the fuel product have also contaminated the groundwater.

The primary contaminant at ST41 is the fuel product JP-4, although other types of fuel products may also have been stored in the tanks. The main compounds of concern in JP-4 are benzene, toluene, ethylbenzene, and xylenes (BTEX). Benzene, a known human carcinogen, is the most toxic and mobile of the BTEX compounds.

The ongoing RI/FS will determine the full extent of contamination at ST41. The following information has been obtained from previous investigations. Subsurface soil samples contain elevated levels of BTEX, lead, and total petroleum hydrocarbons. Free product was observed floating on top of the groundwater in two monitoring wells downgradient of the tanks. In one well 125 feet south of the tanks, 0.30 feet of product was encountered at 14.5 feet below ground surface. In a well 25 feet north of the tanks, 1.62 feet of product was encountered at 18.21 feet below ground surface. Data collected from monitoring wells indicate that contaminants, including benzene, toluene, ethylbenzene, trichloroethene (TCE), and metals are present at levels above MCLs. A surface water sample from the north seep indicates that benzene is present above the Alaska Water Quality Standards (AWQS). Table 1 summarizes this information.

Benzene concentrations in groundwater range from 10 micrograms per liter ($\mu\text{g/L}$) to 15,000 $\mu\text{g/L}$ south of the tanks and were measured at 1,600 $\mu\text{g/L}$ at one location north of the tanks. TPH contamination exhibits a similar distribution, ranging from 0.3 milligrams per liter (mg/L) to 730 mg/L south of the tanks, and 120 milligrams per liter (mg/L) north of the tanks. TCE was detected at 12 $\mu\text{g/L}$ in groundwater from one monitoring well located northeast of the tanks, and will be addressed in the ongoing RI/FS.

A surface water (seep) sample was collected on the north side of the moraine in the wetlands approximately 200 feet northwest of the tanks. The sample contained BTEX concentrations of 1,670 $\mu\text{g/L}$ with benzene at 400 $\mu\text{g/L}$. Total arsenic was also slightly elevated at 0.07 mg/L; the MCL is 0.05 mg/L. Visible petroleum contamination was observed at the two seeps approximately 200 feet south of the tanks on the south side of the moraine.

Antimony, arsenic, cadmium, chromium, lead, nickel, selenium, and thallium have been detected above MCLs in groundwater from monitoring wells located near the tanks and the tank sludge disposal area. The highest metals contamination was evident in groundwater collected from a monitoring well located north and hydrogeologically downgradient of the sludge disposal area west of the tanks. Future RI activities will attempt to determine if the metal concentrations can be attributed to Elmendorf AFB operations or if the observed concentrations are representative of natural background conditions.

6.0 SUMMARY OF SOURCE AREA RISKS

The continued movement of contaminated groundwater currently poses the most significant human health risk at ST41. This contamination could potentially affect domestic water supplies. The north surface seep discharges into an adjacent wetlands, posing an ecological risk at ST41. The south seeps discharge into a drainage ditch adjacent to the road, posing risks to human and ecological receptors.

Before a clear understanding of the risks posed by ST41 can be determined, more information must be collected and a quantitative risk assessment must be performed. The risk assessment will be conducted during the ongoing RI/FS. Based on existing data, BTEX compounds are considered to pose the most significant risk. Contaminants detected include, but are not limited to, benzene, toluene, ethylbenzene, xylene, metals, and TCE. The benzene concentration is above the MCL established by the EPA for protection of drinking water aquifers. The contamination from the seeps will continue and detected groundwater contaminants are likely to spread if no action is taken.

Contaminants have consistently been observed beneath ST41 in the shallow aquifer. Existing data indicate that benzene is present in the groundwater as far as 400 feet to the

south and 250 feet to the north of ST41, although the actual boundary of the contamination is uncertain.

7.0 DESCRIPTION OF ALTERNATIVES

The USAF, USEPA, and ADEC initially screened a range of alternatives that would achieve significant risk reduction while the final remedy for ST41 is being developed. The list was narrowed to the following three alternatives for evaluation in the Proposed Plan:

- **Alternative 1** - No Action;
- **Alternative 2** - Product Removal Using Existing Storage Tanks and Seep Containment; and
- **Alternative 3** - Product Removal Using Recovery Wells and Seep Containment.

The no-action alternative was evaluated consistent with the requirements of the NCP and serves primarily as a point of comparison for other alternatives. The other two alternatives were selected for more detailed evaluation because they could be readily implemented using commonly available technologies and equipment. If effective, the two alternatives would reduce risk by controlling further migration of contaminants from the seep(s) and by initiating removal of a source of contamination through extraction of the fuel product floating on the groundwater.

A description of the three alternatives follows.

7.1 Alternative 1 - No Action

Under this alternative, no interim remedial actions would be implemented at ST41. The condition of the buried tanks would be unchanged with groundwater or surface water possibly entering the tanks until an equilibrium of inflow and outflow was reached. The floating product would remain on the shallow groundwater surface and continue to dissolve in the groundwater and migrate away from the tanks. The discharge at the seep areas would continue and the amount and extent of floating product would remain undefined until the RI/FS was completed and a final remedy selected. No costs are associated with the no action alternative.

7.2 Alternative 2 - Product Removal Using Existing Storage Tanks And Seep Containment

Under this alternative, the four existing storage tanks would be utilized for product collection. The tanks would be cleaned to remove any existing product, water, and/or sludge. Floating product would be removed and recycled. Water in the tanks would be pumped and sent to the collection sumps. Sludge would be removed, treated with an emulsion-breaking chemical, and piped to the collection sumps. The tank walls would be perforated, as necessary, to allow larger quantities of fuel product and groundwater to flow back into the tanks for collection. A metered float control system would be used to pump the fluid from the tanks. The fuel/water mixture collected from the tanks would be processed through collection sumps to separate the fuel product from the contaminated water, thus allowing the fuel to be recovered and recycled. Waste water from the collection sumps would be sent to an air stripper for treatment. When the system was no longer effectively extracting fuel, all remaining liquids and sludge would be removed from the tanks. Final tank closure would be addressed in the final remedy for ST41.

The elements described below, seep containment, air stripping, and groundwater monitoring, are common to both Alternative 2 and Alternative 3.

Seep containment would occur through the installation of a perforated pipe or an infiltration trench to collect the floating fuel and contaminated groundwater discharging at the two seeps on the south side of the moraine and one seep on the north side. The collected fuel/water mixture would be gravity-fed to a collection sump, which would allow the lighter fuel to separate to the top of the water. A collection sump would be placed near the seep containment system on the north side and another between the two seep containment systems on the south side of ST41. If geological conditions are found to be favorable during construction of the groundwater collection system, the system might be expanded laterally to collect more free product and contaminated water. Gravity collection systems would be used, where possible, to limit pumping requirements and to minimize mixing of the fuel with the water. If it was determined that the collection sumps were not providing adequate separation, an oil/water separator would be placed in the collection sumps. Fuel from the collection sumps would be recycled or recovered for its heating value. Contaminated soils removed during installation of seep containment systems and collection sumps would be stored on base with other fuel-contaminated soil. The contaminated soil would be addressed in the final remedial action for ST41.

Water from the collection sumps would be pumped to an air stripper for treatment. This air stripper would be located in the immediate vicinity of ST41. Air stripping is the best demonstrated available technology (BDAT) for removing volatile organics, such as BTEX compounds, from contaminated groundwater. In the air stripping process, volatile organics would be transferred from the water phase to the air phase. Iron/biological pretreatment would be included because of the high iron content of the groundwater. Design of the pretreatment unit would take into account other parameters which could affect the efficiency of the air stripper, such as temperature, and suspended and dissolved solids. Air emissions from the air stripper would be treated by carbon adsorption to remove any volatile organics such as benzene, toluene, ethylbenzene, and xylene. Carbon adsorption units would be placed on the air stripper to provide maximum control and minimum release of the volatile organics back into the environment. Discharge air from the carbon adsorption unit would be periodically sampled to ensure that no organics were being emitted in excess of allowable standards. If the air did not meet discharge requirements, enhancements to the carbon adsorption unit or other treatment systems would be evaluated. The spent carbon filters from the air stripping process would be disposed of in accordance with federal and state regulations.

Effluent water from the air stripping process would be discharged to the Anchorage municipal wastewater system through the Elmendorf AFB collection system. Sampling and analysis would be performed to ensure that effluent meets the requirements for discharge into the system. Effluent water would be sampled for BTEX and other organic compounds, and for heavy metals. If air stripping treatment did not meet the effluent requirements for discharge of water into the base sewer system, other water treatment systems would be evaluated.

Groundwater monitoring during the remedial activities would be used to evaluate performance and success of the interim remedial action and aid in the selection of the ultimate remedy for the source area. Monitoring points would be located downgradient and at the edges of the plume as determined by the soil gas survey conducted as part of the OU2 RI/FS field program. Existing monitoring wells, and possibly additional monitoring wells or piezometers, would be used. Monitoring would occur at least three times annually, in early spring, late summer, and late fall, as part of the RI/FS activities. Climatic conditions

make winter sampling events unfeasible. The groundwater would be monitored for BTEX, other volatile organic compounds, and heavy metals. Gradients and product thickness would be measured to determine the movement of product and the effectiveness of the action.

The success of this alternative in terms of the quantity of product and groundwater which could be recovered and treated is directly related to the position of the water table with respect to the tanks. It is unclear whether any or all of the tanks are in contact with groundwater, whether the groundwater gradient could be reversed, and whether any of the fuel product is at a higher elevation than the leaking portions of the tanks.

Engineering design of Alternative 2 would take approximately 6 months. Actual construction would take approximately 30 days but would not occur during winter months. The amount of time required for product to flow back into the tanks is highly uncertain as is the amount of product and water which would be recovered.

The estimated capital cost of Alternative 2 is \$300,800, and estimated operation and maintenance (O&M) costs are \$27,500 per year. The total present worth of Alternative 2 is estimated to be \$438,300 assuming a 5-year period of operation and a 10 percent interest rate.

7.3 Alternative 3 - Product Removal Using Recovery Wells and Seep Containment

In this alternative, four 10-inch diameter extraction wells would be installed to a depth of approximately 40 feet to remove floating product from the groundwater surface on both the north and south sides of the moraine. Two recovery wells would be installed at both the north and south side of ST41 near each of the two monitoring wells in which product has been found. The wells would be pumped to draw down the water table and enhance the collection of the product. The collected fuel/water mixture would be separated and handled as described previously in the Alternative 2 description. The collected water would be treated by air stripping.

The lateral extent of the floating product would be assessed using product probes or soil gas measurements downgradient of the tanks and in wells with known floating product. If the fuel product extends a long distance from the tanks, multiple wells might need to be added to increase product recovery. Information gathered from the performance of these wells would be used to determine the need for additional wells or the need to evaluate other product extraction technologies.

Seep control, air stripping, and groundwater monitoring would be as described previously in the Alternative 2 description.

Engineering design of Alternative 3 would take approximately 6 months. Actual construction would take approximately 30 days but would not occur during winter months. The actual flow rate and quantities of fuel and groundwater expected to be recovered are uncertain. This is because the extent of the product plume is not well defined, and hydrogeologic characteristics of the soil are highly variable.

The estimated capital cost of Alternative 3 is \$329,800, and estimated O&M costs are \$27,500 per year. The total present worth of Alternative 3 is estimated to be \$467,300 assuming a 5-year period of operation and a 10 percent interest rate.

8.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The National Contingency Plan identifies nine criteria to be used to evaluate remedial alternatives. These criteria are described below as they apply to an interim action. The first two listed criteria represent threshold criteria that must be met by the interim action alternatives. The criterion for long-term effectiveness and permanence was not considered relevant, because an "interim" action is, by definition, a short-term remedy. The three interim action alternatives were evaluated against the other eight criteria to select a remedy.

8.1 Criterion 1: Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled.

Based on the preliminary findings, floating product and fuel-contaminated groundwater appear to be restricted to the shallow aquifer, which is not presently used as an on-base drinking water supply. However, future risks to possible downgradient groundwater users might occur if groundwater contaminants continue to migrate away from ST41 and eventually, off base. For this reason, protection of human health and the environment was assessed relative to the ability of each alternative to remove floating product and contain contaminated groundwater coming to the surface at the seeps.

Alternatives 2 and 3 are both protective of human health and the environment. Both would remove floating fuel product, the primary source of contamination, and are protective of future groundwater uses. The proven extraction technology of Alternative 3 may be more reliable than Alternative 2 in collecting floating product. The effectiveness of Alternative 2 involves some measure of uncertainty with changing the groundwater gradient to induce flow of product and contaminated groundwater back into the perforated tanks. Both Alternatives 2 and 3 involve final off-site treatment or disposal of the spent carbon from the air stripper. Under Alternative 1 (no action), the migration and spread of floating product and contaminated groundwater discharging at the seeps would continue until the final remedy was implemented.

8.2 Criterion 2: Compliance with Applicable or Relevant and Appropriate Requirements

The purpose of the interim remedial action is to remove floating product, a known source of contamination from the groundwater surface and to contain contaminated groundwater where it comes to the surface at the seeps until the final remedy is implemented. This interim action is neither intended to restore the aquifer to drinking water conditions, nor to attain all federal and state ARARs relating to cleanup of the aquifer. The USAF, USEPA, and ADEC expect that such ARARs will be met by the final remedy to be selected for the site.

The ARARs for this interim remedy relate to the treatment and disposal of groundwater that is collected and treated during implementation of the interim remedial action and for air emissions resulting from the treatment.

Alternatives 2 and 3 involve the discharge of processed wastewater to the Anchorage municipal wastewater system through the Elmendorf AFB collection system in accordance with Anchorage Water and Wastewater Utility (AWWU) requirements. State and federal air emission standards would be met through the use of carbon adsorption units on the air stripper. The used air stripper carbon would be disposed of in accordance with federal and state regulations. All work in nearby wetlands would be conducted in accordance with the

substantive requirements of the Clean Water Act, Section 404. No chemical-specific ARARs exist for the limited scope of this interim remedial action. No ARARs are identified for Alternative 1 since no action is involved.

8.3 Criterion 3: Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once clean-up goals have been met.

This criterion was not considered due to the limited scope of the interim remedial action. The final remedy at ST41 is expected to provide both long-term effectiveness and permanence.

8.4 Criterion 4: Reduction of Toxicity, Mobility, or Volume Through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the preference for a remedy that uses treatment to reduce health hazards, contaminant migration, or the quantity of contaminants at the site.

Alternatives 2 and 3 would reduce the toxicity, mobility, and volume of groundwater contaminants through the extraction and treatment of fuel product and small amounts of contaminated groundwater. Both Alternatives 2 and 3 would reduce toxicity through treatment of extracted groundwater and seep water. Alternative 3 would actively remove floating product and therefore reduce mobility and volume sooner than Alternative 2. Alternative 2 may be less effective due to the unproven extraction technology and unknown length of time required to draw product back into the perforated tanks. Under Alternatives 2 and 3, spent carbon filters would be disposed of off-site for further treatment. Alternative 1 (no action) would not achieve any of these goals.

8.5 Criterion 5: Short-Term Effectiveness

Short-term effectiveness refers to the period of time needed to complete the remedy and any adverse impacts on human health and the environment that may be posed during the construction and implementation of the remedy.

Alternatives 2 and 3 can be designed and installed in less than one year with minimal impact to human health. Floating product containment can be effected within a short period of time following initiation of pumping. Construction may involve some temporary adverse impacts due to disturbance of adjacent wetlands, but is not expected to increase the current site risk to workers or the surrounding communities. During construction, no noise impact to surrounding communities is anticipated given the large distance (approximately 1.8 miles) to the nearest off-base community and the nature of the construction involved in implementing either of these alternatives. Air emissions and water and solid residual disposal will be regulated by ARARs. Alternative 1 has no short-term effectiveness.

8.6 Criterion 6: Implementability

Implementability refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution. It also includes coordination of federal, state, and local governments to clean up the site.

Implementation of Alternatives 2 or 3 would be relatively straight-forward with few administrative requirements that would cause delays. Both alternatives could be expanded and used as part of the final remedial action. Alternative 2 would utilize existing tanks, possibly making it easier to initiate. Alternative 3 would require more time for the installation of new recovery wells. For either alternative, steep grades and the freeze/thaw cycle will be taken into account during design of the system. The system will not be designed for winter operation. For either alternative, contractor and equipment requirements would be easily obtainable locally.

8.7 Criterion 7: Cost

This criterion examines the estimated costs for each remedial alternative. For comparison, capital and annual O&M costs are used to calculate a present worth cost for each alternative.

Alternative 1 is the least expensive alternative in the short-term but more costly in the long-term since fuel contamination will continue to spread, thus increasing final treatment costs. Alternative 2 has a slightly lower estimated capital cost (\$300,800) than Alternative 3 (\$329,800). The higher cost of Alternative 3 is associated with mobilizing a drilling crew for recovery well installation. Estimated O&M costs (\$27,500 yearly) for Alternatives 2 and 3 are the same. Estimated present worth is \$438,300 for Alternative 2 and \$467,300 for Alternative 3, assuming a 5-year period of operation and a 10 percent interest rate for each alternative.

8.8 Criterion 8: State Acceptance

The State of Alaska Department of Environmental Conservation has been involved in the selection of the interim remedial action and concurs with the selection of the remedy as described in Section 9.0.

8.9 Criterion 9: Community Acceptance

Based on comments received during the public comment period and at the public meeting, the public generally supports the Proposed Plan. Comments received are described in the attached Responsiveness Summary. The major concern of the community in relation to the interim remedial action was that contamination in all media at ST41 be fully addressed in the final remedy.

9.0 SELECTED REMEDY

The selected interim remedial action for this Operable Unit is Alternative 3, Product Removal Using Recovery Wells and Seep Containment. This remedy calls for the design and implementation of an interim remedial action to protect human health and the environment. The goal of this remedial action is to remove floating product, a source of the groundwater contamination. The ultimate level of remediation to be attained for this source area will be determined in the final remedy for ST41.

Alternative 3 includes the following key elements:

- Product extraction from the groundwater surface in the shallow aquifer to minimize further migration of floating fuel;

- Seep containment using collection systems and subsequent product recycling and water treatment;
- Treating the collected water by an air stripping process to meet state regulations and permit requirements;
- Treating the emissions from the air stripping process to meet state regulations and permit requirements;
- Disposing of the treated groundwater in accordance with federal, state, and local regulations by discharge to the municipal wastewater system; and
- Monitoring of the effectiveness of the groundwater containment and treatment process to provide design information for the final remedy.

9.1 Recovery System Approach

The selected remedy includes the installation of four extraction wells to remove floating product from the shallow groundwater surface. Two extraction wells will be located in proximity of each monitoring well in which floating fuel product had been observed during past sampling events. The wells will be pumped to draw down the water table and enhance the collection of the product. Additional recovery wells may be installed to increase product recovery, as necessary. Seeps on the north and south sides of the moraine will be controlled through the installation of perforated pipes or infiltration trenches to collect the fuel/water mixture.

The extent of the fuel plume is not well defined, and hydrogeological characteristics of the soil are highly variable. Thus, the actual flow rate and quantities of fuel and groundwater expected to be recovered are uncertain. An initial engineering estimate has been made that the contaminated groundwater flow at the recovery wells will be 1.0 gallons per minute (gpm) and the flow rate at each seep will average 2.0 gpm. Some changes may be made to the recovery system as a result of the detailed design and construction processes. Such changes, in general, reflect modifications resulting from the engineering design process.

9.2 Effectiveness of Treatment Technology

Air stripping is the selected treatment process. It is a proven technology for the extraction of organic contaminants from groundwater. Prior to air stripping, the fuel/water mixture recovered from the groundwater and seeps will be processed through collection sumps. Fuel from the sumps will be recycled or recovered for its heating value. Contaminated water will be pumped from the sumps to the air stripper for treatment. A pretreatment system will be included, as necessary, to reduce dissolved and suspended solids and microorganisms that might inhibit the operation of the air stripper. Filters and/or residual materials from the pretreatment system will be disposed of in accordance with all federal and state regulations.

It is expected that the air stripper will remove 99.5% to 99.9% of the organics in the contaminated groundwater. An initial estimate of JP-4 solubility in water is 60.88 mg/l. Benzene, the primary contaminant of concern, makes up only 0.59% by weight of JP-4. Thus the maximum concentration in the contaminated water is expected to be 360 parts per billion (ppb). Based on these calculations and assumptions, the air stripper should provide removal of benzene to a concentration of 0.3 ppb in the effluent water which is below the 5.0 ppb MCL for benzene.

Emissions from the air stripper will contain the volatile organic compounds removed from the contaminated groundwater. Prior to discharge to the atmosphere, the air emissions will be treated by carbon adsorption to remove the volatile organics. The spent carbon will be disposed of in accordance with federal and state regulations. Preliminary estimates indicate that the maximum benzene concentrations in the discharge air would be 0.0005 parts per million (ppm). This estimate assumes maximum expected concentrations of benzene in the groundwater, maximum groundwater flow, minimum air flows, complete volatilization of benzene, and a 95 percent removal of benzene by carbon adsorption. The actual expected discharge values will be determined during design of the interim remedial action treatment system.

9.3 Treated Water Disposal

The selected discharge method for the treated water is to discharge to the Anchorage municipal wastewater system through the Elmendorf AFB collection system. Organics concentrations would be well below the AWWU allowable standard for BTEX of 100 ppb and for TPH of 10.0 mg/l.

9.4 Cost

The estimated present worth for the selected remedy is \$467,300 assuming a 5-year period of operation and a 10 percent interest rate (Table 2). The estimated total capital cost is \$329,800. Annual O&M costs are estimated to be \$27,500.

9.5 Summary

The selected alternative calls for the design and implementation of an interim remedial action to protect human health and the environment. The goal of this interim remedial action is to initiate removal of floating fuel product from the shallow groundwater surface, reduce further movement of contaminated groundwater, and eliminate a pathway of contamination to humans, wildlife, and plants from surface water and groundwater. The ultimate level of remediation to be attained at ST41 will be determined in a final remedial action for this source area. This interim remedial action will be monitored carefully to determine the feasibility of achieving aquifer restoration with this method and to ensure that hydraulic control of the contaminated plume is maintained. After the period of time necessary to complete the RI/FS and arrive at a final decision for ST41, a final ROD for OU2 will be prepared which will specify the ultimate goal, remedy, and anticipated time-frame. Upon completion of this RI/FS, the interim system may be incorporated into the design of the remedy specified in the final remedial action ROD.

10.0 STATUTORY DETERMINATIONS

The Air Force's and EPA's primary responsibility under their legal CERCLA authority is to select interim remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA, as amended by SARA, provides several statutory requirements and preferences. The selected remedy must be cost-effective and utilize permanent treatment technologies or resource recovery technologies to the maximum extent practicable. The statute also contains a preference for remedies that permanently or significantly reduce the volume, toxicity, or mobility of hazardous substances through treatment. CERCLA also requires that the selected remedial action for the site must comply with ARARs established under federal and state environmental laws, unless a waiver is granted.

TABLE 2
ESTIMATED COSTS
PRODUCT REMOVAL USING RECOVERY WELLS AND SEEP CONTAINMENT

Four large-diameter, fuel recovery wells will be installed to collect the floating product. Some groundwater will be removed to create a fuel gradient toward the well. Fuel and water will be separated, the fuel recycled, and the water treated by air stripping and carbon adsorption. The treated water will be discharged to the municipal sewer system through the base collection system. Contaminated water seeping north and south of the tanks will be collected, separated and treated in the same manner as the fluid recovered from the wells.

Item No.	Description	Quantity	Units	Unit Price	Total
Capital Cost					
	<u>Fuel Recovery</u>				
1.	Fuel Recovery Wells	4	each	\$15,000	\$60,000
2.	Tanks Pump and Piping	2	each	\$7,500	\$15,000
3.	Observation Wells	12	each	\$2,000	\$24,000
	<u>Water Treatment</u>				
4.	10 GPM Air Stripper	1	each	\$4,000	\$4,000
5.	Vapor Phase Carbon Unit	1	each	\$3,500	\$3,500
6.	Pretreatment Unit	1	each	\$4,000	\$4,000
7.	Surge Tank	1	each	\$2,000	\$2,000
8.	Mobilization	1	lump sum	\$4,000	\$4,000
9.	Installation	1	lump sum	\$4,500	\$4,500
10.	Sewer	2300	feet	\$46	\$105,800
	<u>Seep Control</u>				
11.	Interceptor Trenches	125	feet	\$56	\$7,000
12.	Collection Sumps/Separators	2	each	\$10,000	\$20,000
	Subtotal				\$253,800
	Contingencies @ 20%				\$51,000
	Engineering @ 10%				\$25,000
	Total Capital Cost:				\$329,800
Annual Operation and Maintenance Costs					
1.	Collection Sump Pumps				\$1,000
2.	Air Stripper				\$1,000
3.	Carbon Disposal				\$4,500
4.	Monitoring and Reporting				\$5,000
5.	Analytical Laboratory				\$15,000
6.	Tank Pumping and Piping				\$1,000
	Total O&M Costs:				\$27,500
	Present Worth:				\$467,300
(assuming 10% interest and 5-year duration)					

The selected alternative for interim remedial action is protective of human health and the environment. It meets ARARs within the limited scope of the action and is cost effective. The preferred alternative is consistent with the statutory mandate for treatment to the maximum extent practicable. It represents the best balance of trade-offs among the alternatives with respect to pertinent criteria given the limited scope of the action. Because this is an interim action, review of this remedy will be ongoing as the Air Force continues to develop final remedial alternatives for the site.

10.1 Protection of Human Health and the Environment

The selected interim remedial action protects human health and the environment by initiating removal of the source of contamination through extraction of the product floating on the shallow groundwater, and also by reducing the further migration of fuel constituents in groundwater discharging at the seeps. The selected remedy thus reduces the threat to future potential drinking water supplies located beyond the current site boundaries.

The treatment of contaminated water will be to a level that meets ARARs and is protective of human health and the environment. The contaminants will be permanently removed from the groundwater through the treatment process which includes air stripping. As necessary, pre-treatment and post-treatment processing will be employed to ensure the disposed water and treatment residues do not constitute an unacceptable risk to human health or the environment.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all applicable or relevant and appropriate action- and location-specific requirements (ARARs). No chemical-specific ARARs exist for the limited scope of this interim remedial action. The ARARs are presented below.

10.2.1 Action-Specific ARARs

- Federal Resource Conservation and Recovery Act regulations set requirements for identifying, generating, treating, storing, disposing, transporting, and recovering/reclaiming hazardous waste as set forth in 40 CFR Parts 262-264, 266, and 268.
- Federal Clean Water Act criteria and standards for the National Pollutant Discharge Elimination System set forth in 40 CFR Part 125 establish criteria and standards for the imposition of technology-based treatments including effluent limitations. These will be met at the Elmendorf AFB control manhole for the basewide discharge permit to the AWWU sewer.
- Federal Clean Air Act regulations on standards of performance for new stationary sources set forth in 40 CFR Part 60 establish design standards for new sources including air strippers.
- Federal Clean Air Act regulations on national emission standards for hazardous air pollutants set forth in 40 CFR Part 62 establishes criteria and standards for air quality and air emissions.
- State of Alaska Hazardous Waste Management regulations (18AAC62) adopt federal RCRA requirements with additional criteria.

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- State of Alaska Wastewater Disposal regulations (18AAC72) provide for permits to dispose of non-domestic wastewater into or onto land, surface water, or groundwater.
- State of Alaska Air Quality Control regulations (18AAC50) establish criteria for ambient air quality.

10.2.2 Location-Specific ARARs

- Federal Clean Water Act (Section 404(b)(1)) guidelines for specification of disposal sites for dredged or fill material set forth in 40 CFR Part 230 establish criteria for restoring and maintaining the chemical, physical, and biological integrity of waters of the United States through control of discharges to dredged or fill material.

10.3 Cost Effectiveness

The selected interim remedial action is the most cost-effective alternative, because it protects human health and the environment, attains ARARs, and meets the objectives established for the interim action in a way that is proportional to its cost. The cost of the selected remedy is slightly higher than Alternative 2; however, there are concerns about the effectiveness of Alternative 2 for the purposes of this interim action. Alternative 1 is the least expensive, but does not achieve the objectives of the interim action.

10.4 Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

Although the selected interim remedial action has certain features of a permanent solution because of its use of a treatment technology, this is a limited scope action and is not intended to provide a final remedy for this site. The minimization of further significant contaminant spread in the groundwater through extraction and treatment will permanently reduce the toxicity, volume, and mobility of contaminants by removing the contaminants from the water and collecting them on activated carbon for off-site recycling or destruction. The treatment process for the extracted groundwater will be designed to meet or exceed state and federal standards for the protection of human health and the environment prior to discharge.

10.5 Preference for Treatment as a Principal Element

This action is being undertaken primarily to remove the source of contamination and limit the spread of contaminants in the groundwater in the shallow aquifer beneath ST41. While this interim action does employ treatment, the statutory preference for remedies employing treatments that permanently and significantly reduce the toxicity, mobility, or volume of the hazardous substances, pollutants, or contaminants as a principal element will be more fully addressed in the final decision document for this operable unit.

11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

The selected interim remedial action is the preferred alternative presented in the Proposed Plan and during the public meeting. No changes to the components of the preferred alternative have been made.

FINAL

RESPONSIVENESS SUMMARY

for

RECORD OF DECISION

ELMENDORF AIR FORCE BASE

ANCHORAGE, ALASKA

OPERABLE UNIT 2, SOURCE AREA ST41 - INTERIM REMEDIAL ACTION

JUNE 1992

FINAL
RESPONSIVENESS SUMMARY
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RECORD OF DECISION
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OVERVIEW

This responsiveness summary has been prepared to address public comments associated with the Proposed Plan for interim remedial action (IRA) at Source Area ST41 at Elmendorf Air Force Base (AFB). The base is located just north of the city of Anchorage, Alaska. This IRA is being conducted as part of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) studies to investigate and clean up hazardous waste contamination at seven operable units (OUs), or study areas, at the base. ST41, also known as Four-Million Gallon Hill, is part of the OU2 CERCLA studies at the base. ST41 consists of an underground fuel storage facility of four one-million gallon tanks situated near the western edge of the base.

In February 1992, the U.S. Air Force released a Proposed Plan for an IRA at ST41 to reduce the movement of contaminated groundwater in the area of the underground fuel storage facility. The preferred alternative recommended by the Air Force, the U.S. Environmental Protection Agency (EPA), and the Alaska Department of Environmental Conservation (ADEC) involves removal and recycle of fuel product using recovery wells and seep containment. This action was intended as a short-term, interim action while long-term CERCLA studies are being conducted. Long-term OU2 studies will fully define the extent of contamination at this study area, in order to identify a final cleanup plan that would address all remaining contamination.

The Proposed Plan for the IRA at ST41 was released by the Air Force for public comment from February 17, 1992 through March 17, 1992. A public meeting to present the Proposed Plan and receive public comment was held on February 27, 1992. Most of the comments received did not specifically focus on the commentor's support or opposition to the preferred alternative or other IRA alternatives. Based on the types of comments and concerns that were received, people generally appear supportive of the preferred alternative as an *interim* action but are concerned that contamination in all media at ST41 would be addressed in the final remedy.

At the public meeting, one community member inquired if an alternative had ever been considered that included removal of the four underground fuel storage tanks and contaminated soils. An Air Force representative responded by explaining that the objective of the IRA was to perform a short-term action to control contaminant movement by removing the primary source of contamination, floating fuel product. As a result, removal of contaminated soil and removal of the tanks were not considered within the IRA alternatives. The community member later submitted a written comment that supported the selection of the preferred alternative, product removal using recovery wells and seep containment, as the interim action.

No other comments were received that specifically supported or opposed the preferred alternative or other IRA alternatives. One internal Air Force comment was received that stated an opposition to any alternative that would decrease the height

of Four-Million Gallon Hill, which provides a nearby communications antenna with natural protection from electromagnetic and radio frequency interference. However, this comment would not impact selection of either the preferred alternative or any other IRA alternatives evaluated, since none of the interim actions would have had this effect.

After careful review of all public comments, the Air Force, in coordination with EPA and ADEC, has selected the preferred alternative, product removal using recovery wells and seep containment, as the IRA to be conducted at ST41. This action, which was selected in its entirety with no modifications or changes, is documented and explained in the attached Decision Summary. Under the selected IRA, collection systems will be used to contain fuel seeps that have been observed on the north and south sides of ST41. Floating fuel product and groundwater will be extracted from the shallow aquifer. Fuel product will be recycled and the extracted groundwater will be treated by an air stripping process to meet federal, state, and local regulations and permit requirements.

BACKGROUND ON COMMUNITY INVOLVEMENT

The purpose of this section is to briefly summarize major community concerns and to describe how the Air Force plans to address such concerns.

In general, overall environmental awareness and concern in Alaska is high, due to the state's large amount of natural resources. Such interest is reflected in the large number of environmental organizations (an estimated 100) that exist in the state. In particular, following the March 1989 *Exxon Valdez* oil spill, awareness of environmental issues and concerns about environmental protection increased dramatically in the state.

Community interest about environmental issues at Elmendorf AFB is low but has evolved gradually, as awareness of cleanup activities at the site has increased. In August 1990, placement of Elmendorf AFB on the National Priorities List (NPL) generated some initial interest in environmental issues at the base. In recent months, the CERCLA community relations program for Elmendorf AFB has been initiated and public interest in environmental issues and participation in the CERCLA process has begun to increase. Recent activities, including a February 1992 public workshop and the public meeting for this IRA, have generated some interest from concerned citizens, environmental organizations, and local contractors. This involvement is expected to increase as CERCLA studies progress and additional short- and long-term remedies for contamination problems are identified.

Major community issues and concerns associated with environmental cleanup programs at Elmendorf AFB include:

- information on the cleanup process;
- the composition of the Technical Review Committee;
- job opportunities associated with environmental cleanup; and
- the need for a base outreach program.

Each of these concerns is briefly described below. These issues were identified in community interviews held in conjunction with preparation of the Elmendorf AFB community relations plan, as well as from comments received at the February 1992 public workshop and during the recent public comment period on this IRA.

Public Information. One of the primary issues raised by the public has been access to information regarding contamination issues and cleanup efforts at Elmendorf AFB. Local officials and residents have requested that information be made available to them on a regular basis.

In response to this concern, the Air Force held a public workshop on February 5, 1992 to describe the environmental cleanup programs underway at Elmendorf AFB and opportunities for community participation. On that same day, information repositories were established in the community. These repositories will be updated throughout the CERCLA remedial process with copies of site-related study documents and public information materials.

Quarterly issues of *Environmental Update* will be distributed to individuals on the mailing list. This newsletter will provide community members with updated information about environmental cleanup activities at Elmendorf AFB. The first issue of *Environmental Update* was distributed in February 1992. At significant milestones during the environmental cleanup process, public meetings will be held and additional fact sheets will be distributed to the public.

Technical Review Committee. A second major concern has been the composition of the Technical Review Committee (TRC). Several environmental organizations have expressed concern about the composition of the TRC and have requested that the TRC include a representative for environmental organizations. The Air Force has expanded the basic TRC composition to include two additional community members, for a total of three community representatives. Representatives will be from the Mountain View and Government Hill communities, and the Anchorage community. Their responsibilities include gathering and communicating concerns about decisions and proposed actions on Elmendorf's cleanup program from citizens, to include concerned groups, such as environmental organizations.

Contractor Opportunities. A major concern within the Anchorage community stems from the high level of interest in job opportunities associated with environmental cleanup activities at Elmendorf AFB. Local residents are concerned that labor will be brought in from outside the area, while abundant labor may be available locally.

The Air Force is required by federal law to consider all responsive, responsible contractors regardless of location. However, in response to this concern, the Air Force plans to keep the local population informed of environmental cleanup work planned at the base and encourages local contractors to be added to the mailing list. Contractor issues and concerns may be addressed in the quarterly newsletter, *Environmental Update*. Elmendorf AFB contracting representatives have been, and will continue to be, available at public workshops and public meetings to address questions and concerns about job opportunities associated with cleanup efforts.

In addition, at the recent public meeting on the IRA at ST41, detailed summaries of the estimated costs for the various alternatives were distributed to interested parties. These summaries gave an indication of the type and level of contractor support that would be necessary to implement the IRA.

Base Outreach Program. Due to the large number of persons living and/or working on the base (13,523), both the Air Force and some community members are interested in the development of specific community relations activities for base personnel. During the development of the Elmendorf AFB community relations plan,

efforts to identify interested base personnel and assess the interests and concerns of the base population were made, but were unsuccessful. At the public meeting on the IRA at ST41, a representative of Alaska Center for the Environment inquired about an outreach program for base residents and employees.

The Air Force is currently developing a strategy to better identify the interest and concerns of residents and employees on the base regarding environmental cleanup activities. Community relations activities under consideration include a survey of the base population, an informal on-base workshop, a bulk mailing of *Environmental Update* to residents in base housing, and an internal information program using the base newspaper, the *Sourdough Sentinel*.

COMMENTS AND RESPONSES

This section summarizes and responds to community concerns and comments provided during the recent public comment period on the Proposed Plan for an IRA at ST41. In order to encourage public comment, the Air Force inserted pre-addressed, written comment forms in distributed copies of the Proposed Plan. In addition, comment forms were also distributed at the February 27, 1992 public meeting held at the Z.J. Loussac Library's Wilda Marston Theater to receive comments on the Proposed Plan.

At the conclusion of the public comment period, a total of seven sets of written comments were received from citizens, local contractors, and environmental groups, as well as from an on-base Air Force organization. At the February 27, 1992 public meeting, four individuals asked questions and/or submitted follow-up written comments.

Oral comments received at the public meeting are documented in a verbatim transcript which has been placed in the Elmendorf AFB administrative record file and the information repositories. Written comments received during the public comment period appear in their complete text in the administrative record file. Copies of the administrative record file are available for public review at the site information repositories. The repositories are located at the Bureau of Land Management's Alaska Resources Library and the University of Alaska at Anchorage's Consortium Library.

Public comments have been paraphrased for greater clarity and grouped by topic, in order to respond concisely to overlapping comments that address a common concern.

Purpose and Scope of the IRA

- (1) An Alaska Center for the Environment representative requested clarification about the goal of the IRA. She wondered whether the goal of this action is to remove a primary source of contamination or whether it is to clean up the groundwater to contaminant levels specified in federal drinking water standards.

USAF Response: The main goal of this short-term IRA is to remove a primary source of contamination. As was stated in the Proposed Plan, this IRA has four major objectives: 1) to prevent the spread of fuel constituents; 2) to remove and recover floating fuel product from the shallow groundwater surface in the vicinity of the tanks; 3) to collect and control contaminated groundwater where it

comes to the surface at the seeps; and 4) to initiate a cleanup plan that is expected to be consistent with the final remedy for ST41.

It is not the goal of this IRA to treat contaminated groundwater to drinking water standards. Since the full extent and volume of contaminated groundwater is presently unknown, this would not be a realistic goal for the IRA. The remedial investigation/feasibility study (RI/FS) for OU2 is currently anticipated to be completed in the spring of 1994. These two long-term cleanup studies will fully delineate the nature and extent of contamination in all media and identify and evaluate cleanup alternatives for the final remedy. Once the RI/FS has been completed, a final action for the area will be proposed and submitted to the public for comment in the Proposed Plan for final cleanup of OU2. This final action will address cleanup of contaminated groundwater and all other remaining contamination.

- (2) An Alaska Military Toxics Network representative requested clarification about the scope of the IRA. He inquired whether removal of the fuel tanks and the contaminated soils had ever been considered as a fourth alternative for this IRA, due to the apparently serious nature of pollution at Four-Million Gallon Hill. He also wondered how the cost of such an alternative would compare with the cost estimate for the proposed IRA.

USAF Response: In the initial phases of the alternative screening for the IRA, it was determined that cleanup of the soils and removal of the tanks was beyond the scope of a short-term, or interim action. Because soil and tank removal were not retained for further consideration, cost estimates for such an alternative were not developed.

As stated in the first question above, the focus of the planned IRA was to control the contaminated water coming to the surface at the seeps and to recover as much floating fuel product on the water table as possible. However, the tanks and contaminated soils will be addressed as part of the final cleanup plan for Four-Million Gallon Hill.

- (3) An Alaska Military Toxics Network representative questioned whether five years was an adequate amount of time to operate the IRA treatment system for cleanup of the site, considering that fuel can frequently migrate to the water table for much longer periods of time.

USAF Response: The purpose of estimating the duration of the IRA treatment system was to provide a comparison of costs among the alternatives under consideration. The duration of the IRA treatment system was estimated at five years, because it was anticipated that the final remedial action for OU2 would be implemented within this time frame. If necessary, the final remedy may include continued operation of the recovery and treatment system initiated during the IRA. The components of the preferred alternative for final cleanup of ST41 will be described in the Proposed Plan for the final remedy for OU2, which is scheduled for completion in the summer of 1994.

Water Quality Issues

- 1) A citizen inquired about the basis for stating that known contamination is limited to the shallow aquifer. He wondered whether soil borings and sampling and

analytical data were conducted and evaluated, and whether such data were used as the basis for this assumption.

USAF Response: Statements about known contamination in the aquifers are based on data collected to date. Data from samples collected in the summer of 1990 and the fall of 1991 from 17 existing monitoring wells have identified contamination in the shallow aquifer. Data from samples collected in August 1988 from two water production wells on Elmendorf AFB (which draw water from the deeper aquifer) have failed to identify any contamination in the deeper aquifer.

However, as part of the RI/FS for long-term cleanup of OU2, further investigations of the shallow and deeper aquifers will be conducted to more fully delineate the extent of groundwater contamination at ST41. In the summer of 1992, several monitoring wells will be installed in the shallow and deep aquifers. Both existing and new monitoring wells will continue to be sampled periodically during the RI/FS process for OU2.

- (2) A citizen expressed concern over the high levels of benzene identified in the groundwater at ST41 and whether this had been adequately evaluated during the development of the Proposed Plan. He also questioned why a Black & Veatch report, dated January 1, 1990 [available at the information repositories for the site], stated that methylene chloride was the only carcinogen at the site, when levels of benzene, a known carcinogen, were reported at levels as high as 21,000 micrograms per liter in the groundwater at ST41.

USAF Response: The statement made in the Black and Veatch report that methylene chloride was the only carcinogen reported at ST41 is in reference to the soil samples taken in 1987. The next section of that report (as part of the groundwater section) clearly states that benzene (a known carcinogen) has been detected in groundwater samples collected at ST41. Benzene is being targeted as the primary contaminant of concern during the IRA cleanup activities. Treatment levels being established for the air stripper and carbon adsorption unit are based on the standards for benzene in both the air emissions and wastewater discharge.

- (3) An Alaska Military Toxics Network representative expressed concern about the proximity of Four-Million Gallon Hill to domestic wells in the Government Hill neighborhood (a distance of less than two miles). The representative queried whether wells in the Government Hill residential community had been tested for benzene contamination.

USAF Response: Although the full extent of contaminant migration at ST41 is currently unknown, it is not likely that domestic wells in the Government Hill community have been contaminated from this source. All existing data obtained from the sampling of a number of monitoring wells and base production wells in the migration path between Government Hill and Four-Million Gallon Hill indicate that contaminants are believed to be contained within an approximate 500-foot radius around ST41. In addition, the IRA at ST41 is expected to minimize additional contaminant migration by removing a primary contaminant source, floating fuel product. The full extent of contamination at ST41 will be defined in the final OU2 RI/FS report which is scheduled to be completed in the spring of 1994. When completed, this document will be made available to the public at the information repositories identified in Attachment A.

Domestic wells in the Government Hill residential community have not been tested for benzene contamination. If sampling data from the OU2 RI should indicate that off-base contamination has occurred, the capability exists for ADEC to sample private or domestic wells.

- (4) A citizen expressed concern about the potential presence of metals in the groundwater at ST41. He inquired about what remedial actions would be recommended for the site to eliminate these metals, if additional assessment work verifies the presence of metals in the groundwater at levels above ambient (or surrounding) background concentrations.

USAF Response: Preliminary sampling has identified various metals at elevated levels in an isolated area in the westernmost portion of ST41. These isolated elevated concentrations are not associated with the targeted fuel contamination being cleaned up as part of the IRA for ST41.

As part of RI/FS studies for OU2, further assessment is being performed to determine if these metal concentrations are associated with previous waste disposal practices or if they are naturally-occurring background levels characteristic of the geochemistry of the site. Removal of metals contamination from the groundwater or soils will be investigated further as part of the final cleanup plan for OU2.

- (5) A citizen requested information about the impacts that the presence of metals could have on wastewater discharge during the IRA. He inquired whether high metals contamination would require a re-evaluation of the preferred alternative to meet wastewater discharge criteria for metals.

USAF Response: As stated above, no data currently exist to indicate that metals contamination is a concern in the area identified for immediate action as part of the IRA. Therefore, it is not expected that the selected IRA will require re-evaluation.

However, if new data should indicate that elevated levels of metals exist in the groundwater to be treated in the IRA, then the potential exists for discharge to exceed permitted requirements (as defined by the Municipality of Anchorage Water and Wastewater Utilities). In that event, some type of metals' pretreatment would be evaluated for inclusion in the IRA treatment system.

Soils-Related Issues

- (1) A citizen inquired whether soil borings had been conducted at ST41 in order to delineate the lateral and horizontal extent of soils contamination. He felt that the extent of soils contamination could seriously impact the specific remedial action to be implemented.

USAF Response: The scope of this short-term IRA does not include fully delineating the lateral and horizontal extent of soils contamination at ST41. However, nearly thirty soil borings have been completed, to date, in order to begin to characterize the extent of soils contamination. Additional soil borings will be completed during the summer of 1992 as part of the RI data collection process to fully characterize soil contamination at OU2. Data from all of these borings will be used to develop alternatives for the final cleanup plan for OU2.

- 2) Air Force Electronic Security Group logistics personnel requested that any action to be taken would not lower the present elevation of the Elmendorf moraine (the geologic unit on which Four-Million Gallon Hill is situated). This comment supported any earthmoving efforts that would increase the ridge's height and opposed any actions that would decrease the height of the ridge. The ridge provides a nearby communications antenna with natural protection from electromagnetic and radio frequency interference.

USAF Response: The selected IRA at ST41 will not include excavation of soils, other than minor trenching. However, the Proposed Plan for the final remedy for OU2 (scheduled for release in the summer of 1994) might potentially include tank removal or soils removal as a component of cleanup. This issue would be of concern during the screening and detailed evaluation of final cleanup alternatives which will occur as part of the feasibility study for OU2.

Air Quality Issues

- (1) An Alaska Center for the Environment representative expressed concern over the level of hydrocarbon emissions that would be discharged from the air stripper/carbon adsorption unit. She inquired whether the hydrocarbon emissions from this unit had been estimated.

USAF Response: The IRA treatment system is projected to be a low-volume, low-flow system and is expected to generate small quantities of benzene and other contaminants. Preliminary estimates indicate that the maximum benzene concentrations emitted from the air stripper would be 0.01 parts per million (ppm). This estimate assumes maximum groundwater concentrations, maximum groundwater flows, minimum air flows, and complete volatilization of benzene (that is, "worst-case" conditions). In addition, emissions from the air stripper will be treated in a carbon adsorption unit (see response to Question No. 2 below). Consequently, the concentration of benzene that would be discharged to the air would be even lower (an estimated 0.0005 ppm) following such treatment.

For comparative purposes, the American Conference of Governmental Industrial Hygienists' proposed 1991-1992 threshold limit values recommend that industrial workers should not be exposed to more than an eight-hour, time-weighted average of 0.1 ppm of benzene. This proposed occupational threshold value is, therefore, two hundred times greater than the estimated concentration to be emitted following carbon adsorption.

It should be noted that these estimates are preliminary. The expected discharge values will be known following completion of the detailed design for the IRA treatment system (scheduled for completion in the winter of 1992.) This information will be available at the completion of the remedial design process for the IRA.

- (2) An Alaska Center for the Environment representative expressed concern about the efficiency of the carbon adsorption unit that would be placed on the air discharge of the air stripper. She requested information on the effectiveness of this unit in removing hydrocarbons from the discharged air.

USAF Response: The planned carbon adsorption unit is expected to have a very high removal efficiency of 95 percent. Assuming that a maximum benzene concentration of 0.01 ppm is emitted from the air stripper, the discharge to the air would contain an estimated 0.0005 ppm of benzene, if 95 percent removal is achieved with carbon adsorption (see additional discussion in Question No. 1 above).

- (3) An Alaska Health Project representative asked if an air quality control permit would be required for the air stripper/carbon adsorption unit and expressed concern about what standards would be applied to this unit.

USAF Response: Under section 121 (e) of CERCLA, no federal, state, or local permit is required for the portion of any remedial action conducted entirely on site. Therefore, the base does not have to go through the ADEC permitting process for the air stripper/carbon adsorption unit, but all applicable or relevant and appropriate requirements (ARARs) would be met through the Elmendorf AFB base-wide air permit. Emissions from the air stripper/carbon adsorption unit will be incorporated with other emissions on base and must not exceed those standards in the base-wide permit.

The final design for the IRA treatment unit will include calculated values for emissions from the air stripper and vapor-phase carbon adsorption unit. It should be noted that the IRA treatment system emissions design will be reviewed by ADEC Contaminated Sites and Air Program personnel. ADEC will ensure that the emissions generated by the air stripper/carbon adsorption unit will not add emissions in an amount that exceeds the current Elmendorf AFB base-wide air permit.

- (4) An Alaska Health Project representative expressed concern about the level of emissions that would be permitted to be discharged after air stripping/carbon adsorption. She was concerned that, if the IRA treatment system is monitored as part of the base-wide air quality control permit, the Air Force could decrease benzene emissions from a different source in order to enable them to discharge more benzene from the air stripper/carbon adsorption unit.

USAF Response: Reducing emissions from a different source to allow more emissions from this system is possible. Presently, the Air Force has proposed to periodically sample emissions from the treatment system to track system efficiency and potential contaminant breakthrough. This information would be incorporated into the reports provided to ADEC in compliance with the base-wide permit.

At this time, the Air Force anticipates that low concentrations of emissions will be released from the IRA treatment unit. If the emissions are calculated to be small quantities, ADEC may request a model to be used that has a conservative safety margin to establish the carbon adsorption collection and saturation rate.

If based on the final engineering design, it is determined that the system will produce large quantities of emissions, then ADEC may require a continuous, on-line monitoring device to be installed on the treatment unit. Such data could be reviewed by ADEC to ensure that the emissions from this source have not been offset by lower emissions from other sources on base. However, at this time, the Air Force does not anticipate the need for continuous air monitoring due to the low concentrations of emissions estimated to be released.

The need for modeling data versus an on-line, continuous monitoring device will be more fully evaluated by ADEC at the conclusion of the remedial design process, through a review of final design parameters, volume, and flow.

Wetlands Issues

- 1) A citizen requested information about whether the wetlands north of the site had been inventoried for critical areas/resources or for particularly sensitive species.

USAF Response: A base-wide ecological survey performed by CH2M Hill (1991) included an existing information search and on-site observation and surveys. Local, state, and federal agencies and publications were consulted by CH2M Hill to assist in establishing whether any of the areas identified qualified as critical habitats or sensitive environments. In addition, these sources were used to identify any threatened or endangered species that may inhabit or migrate through the area. None of the plant, bird, fish, or mammal species at Elmendorf AFB were identified as candidates for listing as threatened or endangered species.

In addition to the CH2M Hill study, the wetlands area associated with ST41 will be the focus of an ecological risk assessment conducted as part of the ongoing RI/FS for OU2. During the initial phase of this investigation, the ecological setting associated with OU2 will be characterized. Ecological information, including location and abundance of habitat and community types (especially critical habitats and sensitive areas) and resident species (especially threatened, rare, and endangered species), will be obtained from existing background information and visual observation. This information will be used in the ecological risk assessment to identify and quantify contaminants of ecological concern. To the extent possible, risks to species, populations, habitats, and communities associated with OU2 resulting from exposure to these contaminants will then be calculated. This information will be used in the selection of cleanup standards and remedial alternatives for the final OU2 remedy.

- (2) A citizen expressed concern about the impact of the north seep on the nearby wetlands area, specifically over the potential for hydrocarbon and BTEX (benzene, toluene, ethylbenzene, and xylene) contamination to be present in the wetlands. He noted that the proposed IRA would not include any action to eliminate contamination currently existing within these wetlands. He inquired whether seep discharge into the wetlands and potential wetlands contamination would be addressed as part of the final cleanup action.

USAF Response: The final cleanup action at ST41 will include consideration of the wetlands. During the OU2 RI at ST41, the presence and extent of contamination within the wetlands will be determined. An ecological risk assessment will also be performed to determine the potential impacts to both floral and faunal species within, near, or affected by these wetlands.

It should be noted that there are no wetlands located on the south side of Four-Million Gallon Hill. It should be further noted that, the selected IRA at ST41 will contain the seeps, thus eliminating a pathway for further contaminant migration to the wetlands.

Public Involvement Issues

- (1) An Alaska Health Project representative expressed concern about public involvement in the design process. She wondered whether the public would be allowed to review design information for the IRA treatment system prior to the system being installed.

USAF Response: Upon completion of the final engineering design, the Air Force will issue a fact sheet and will provide the opportunity for a public briefing prior to the initiation of remedial action.

- (2) An Alaska Health Project representative asked if an air quality control permit for the air stripper/carbon adsorption unit would be made available to the public. If a specific air quality control permit would not be required for this unit, she wanted to know what alternative procedure or document containing information on the specific standards to be met by the unit would be available for public review.

USAF Response: Under CERCLA, no individual permit is required for the air stripper/carbon adsorption unit to be used as part of the IRA (see Air Quality Issues, Question No. 3). However, Elmendorf AFB has a base-wide air permit which is available for public review through ADEC, South Central Regional Office (3601 C Street, Suite 1334, Anchorage, AK).

- (3) An Alaska Health Project representative expressed concern about the availability of monitoring information during the operation of the IRA treatment system. The commentor inquired whether periodic monitoring data would be made available to the public about the type and levels of contaminants being detected in the emissions from the air stripper/carbon adsorption unit.

USAF Response: During implementation of the interim action, monitoring data from the air stripper/carbon adsorption unit will be incorporated into base-wide air emissions data. This information will be submitted to ADEC and will be available to the public at ADEC's South Central Regional Office.

In the event that an on-line, continuous monitoring device is required to be installed on the treatment system, this data could periodically be made available to the public, if public interest warrants. (See Air Quality Issues, Question No. 4 for a further discussion of these issues.)

- (4) An Alaska Center for the Environment representative inquired about the need for additional IRAs at Elmendorf AFB. She requested information about any other IRA sites that have been identified for other OUs at Elmendorf AFB. She also inquired about whether these other IRAs would follow a similar public involvement process.

USAF Response: At this time, the Air Force anticipates that additional source areas on base may require interim remedial action. OU4 consists of Source Areas SD24 through SD31 and SS18, which are floor drains at nine maintenance facilities. It is suspected that at one time these floor drains emptied into dry wells, leach fields, or storm drains. A limited field investigation was initiated in February 1992 to determine the location of dry wells and leach

fields. At the conclusion of this investigation in December 1992, an IRA may be initiated to excavate and remove abandoned dry wells or leach fields.

OU7 consists of Source Areas FT23, SS10, SD15, and SS19, which were organic chemical storage and disposal areas. An IRA is currently under consideration for a fire training area at Source Area FT23. Some additional data must be collected before an IRA can be developed.

The Air Force has not identified any additional source areas needing an IRA at this time. However, the need for an IRA can be determined at any stage of the CERCLA process. Therefore, as additional data are collected through ongoing investigations at the seven OUs, additional IRAs may be determined to be appropriate for the site. These IRAs would be used to expedite the removal of primary contaminant sources and prevent the spread of contamination.

If the Air Force proposes additional IRAs on Elmendorf AFB, a public participation process similar to that for the IRA at ST41 would take place, in accordance with CERCLA requirements. A Proposed Plan fact sheet would be distributed to all individuals on the mailing list and placed in the information repositories. A notice would be published in local newspapers describing the preferred action and announcing opportunities for public involvement. Public comments would be received during a 30-day public comment period and a public meeting would be held. After considering public comments, a Record of Decision would be prepared that would delineate the selected IRA and would respond to public comments.

- (5) An Alaska Center for the Environment representative expressed interest in an outreach program for base personnel. She inquired about whether the Air Force had any plans to develop such an outreach program and whether some public meetings could be held on the base, in order to make it more convenient for base personnel to attend.

USAF Response: Due to the large numbers of persons living or working on the base, the Air Force is currently developing a strategy to better identify the interests and concerns of residents and employees on the base associated with environmental cleanup activities. Community relations activities under consideration include a survey of the base population, an informal on-base workshop, a bulk mailing of *Environmental Update* to residents in base housing, and an internal information program using the *Sourdough Sentinel*, the base newspaper.

- (6) An Alaska Center for the Environment representative inquired about whether additional public meetings would be held regarding the IRA at ST41. She requested clarification on whether any other public meetings would be held in association with the actual IRA decision and subsequent remedial work associated with this action.

USAF Response: The purpose of the February 27, 1992 public meeting and public comment period was to receive all comments on the Proposed Plan for an IRA at ST41. After carefully reviewing the comments received during the public comment period, the Air Force has selected the interim action for ST41, which is documented in this Record of Decision.

Prior to final completion of the engineering design for the selected IRA, the Air Force will send a fact sheet to everyone on the mailing list. In addition, the Air Force will provide an opportunity for a public briefing prior to the start up of remedial action.

It should be noted that, with any interim or final action, if new data obtained during the remedial design process should suggest the need for *fundamental* changes in the selected action, then an amendment to the ROD would be warranted. If such fundamental changes to the IRA were proposed, a revised Proposed Plan would be issued and a public meeting would be held in order to receive public comment. However, at this point in the IRA process for ST41, there is no foreseeable need for such an action.

Upon completion of the RI/FS for OU2, which includes ST41, a preferred remedy for the final cleanup plan for OU2 will be identified and presented to the public for comment. At that time, a public meeting will be held to receive public comment on the Proposed Plan for final cleanup of OU2. Following selection of the remedy and prior to final completion of the engineering design for the selected final remedy, an opportunity will be provided for a public briefing on design aspects of the final remedy.

- (7) Several environmental organizations commended the Air Force on the informative quality of their community relations deliverables and on the Air Force's commitment to cleaning up hazardous waste problems on the base. However, one community council representative questioned the Air Force's placement of all community councils on the site mailing list. She suggested that, for cost effectiveness, materials should be sent only to those community councils directly affected by the cleanup work, with a copy of such materials also sent to the Federation of Community Councils for any remaining groups interested in being kept informed of this work.

USAF Response: The Air Force appreciates the support of the commentators who have provided positive feedback on the Elmendorf AFB public involvement process. The Air Force intends to continue to involve all interested individuals and organizations in future interim and final remedial actions at the seven operable units at Elmendorf AFB.

The Air Force also appreciates the suggestion to reduce the number of copies of public information materials because it means a cost-savings to taxpayers on printing and mailing expenses. All local community councils were initially included on the mailing list to provide all potentially interested parties with information on environmental cleanup activities at Elmendorf AFB. With future mailing list distributions, a response card may be included to provide individuals and organizations an opportunity to be removed from the mailing list.

Technical Review Committee Issues

- (1) An Alaska Health Project representative requested clarification about the function of the Technical Review Committee (TRC).

USAF Response: In accordance with section 211 of the Superfund Amendments and Reauthorization Act of 1986 (SARA), the function of the TRC is to review and comment on Air Force actions and proposed actions with

respect to releases or threatened releases of hazardous substances at Elmendorf AFB.

- (2) An Alaska Military Toxics Network representative requested clarification on the Air Force's rationale for restricting the composition of the TRC.

USAF Response: To some degree, the composition of the TRC is mandated by law. SARA requires only federal facilities have TRCs and, in accordance with section 211 (of SARA), a TRC must include a representative of the Air Force, EPA, ADEC, and one community member. However, at Elmendorf, base officials have expanded the TRC's basic composition to include representatives from the Government Hill and Mountain View Community councils in addition to the Anchorage community representative. This is to facilitate involvement by the two communities closest to Elmendorf which could potentially be affected by cleanup activities and contamination. Community representatives' responsibilities include gathering and communicating concerns about decisions and proposed actions on Elmendorf's cleanup program from citizens, to include concerned groups, such as environmental organizations. Also, representatives from the 11th Air Force Medical Center and Fort Richardson will be included on the TRC. The size of the TRC isn't restricted, rather limited in size, to maximize the working efficiency of the group.

- (3) Several environmental organizations expressed concern over the composition of the TRC to be appointed by the Air Force. The Alaska Military Toxics Network, the Alaska Health Project, and the Anchorage Audubon Society requested that the proposed composition of the TRC be expanded to include a representative for local environmental organizations.

USAF Response: The Air Force has expanded the basic TRC composition to include two additional community members, for a total of three community representatives. Their responsibilities include gathering and communicating concerns about decisions and proposed actions on Elmendorf's cleanup program from citizens, to include concerned groups, such as environmental organizations.

Issues Outside the Scope of the IRA at ST41

- (1) A citizen expressed concern over a location showing seepage of contamination that he thought may have originated from ST41. He inquired whether the Air Force was aware that some petroleum product appears to be seeping from the bluff located to the west of the source area. He also wondered whether this area had been investigated for possible connection with contamination at Four-Million Gallon Hill.

USAF Response: The Air Force is aware of reports of a petroleum product seep in the bluff area and has identified the source of the seep as pipelines located in the bank. OU6 CERCLA activities will address Source Area LF04, which is a 20-plus acre landfill located east of Knik Arm bluff on the west side of the base, where the seep has been reported.

During continuing studies at ST41, under OU2, efforts will be made to verify whether petroleum product could be migrating from ST41 toward the bluff. At this time, however, contaminant migration from ST41 is believed to be limited to

a 500-foot radius around ST41. The reported seep in the bluff is approximately 2,500 feet west of ST41.

- (2) A local contractor noted that, at the first public meeting held by the Air Force, the only cleanup technology discussed was bioremediation. He inquired whether bioremediation was the only technology being considered for cleanup work associated with the seven OUs at Elmendorf AFB. This contractor wondered whether thermal remediation would be considered as an option for overall cleanup work at the base.

USAF Response: At the first public meeting, bioremediation was used as an example of the technologies being evaluated as part of the CERCLA process to investigate and clean up hazardous waste contamination at the base. At this point of the evaluation process, this should in no way be construed as the only, or even as a preferred, treatment technology for any cleanup work at Elmendorf AFB. All viable physical, chemical, biological, fixation/stabilization, and thermal processes will be evaluated for application. Analyses of each of these processes will be conducted as part of the feasibility studies for each of the OUs at Elmendorf AFB.

Chemical/Nuclear Ordnance Disposal at the Base

- (1) An Alaska Military Toxics Network representative expressed concern about the potential for chemical weapons to exist on the base. He reported that eyewitness accounts have indicated that chemical weapons (such as nerve gas and mustard gas) were disposed of at Elmendorf AFB. He sought clarification as to whether this information is correct and whether such materials would be included in "Superfund" cleanup studies at the base.

USAF Response: Currently, the Air Force has no knowledge of chemical weapons being disposed of on Elmendorf AFB. The Air Force would appreciate any information from individuals who may be aware of such practices.

In the event the Air Force becomes aware of chemical weapons as a source of contamination on the base, they would be addressed under the Defense Environmental Restoration Program (DERP). DERP was developed by the Department of Defense to focus on military toxics, including chemical, nuclear, and biological weapons. Any such weapons would be addressed under DERP if detected on Elmendorf AFB.

The objectives of the DERP are stated in section 211 of SARA and include:

- identification, investigation, research and development, and cleanup of contamination from hazardous substances, pollutants and contaminants;
- correction of other environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment; and
- demolition and removal of unsafe buildings and structures, including buildings and structures of the Department of Defense at sites formerly used by or under the jurisdiction of the Secretary.

It should be noted that, for a federal facility, cleanup studies under CERCLA are not conducted using Superfund funding, but is drawn from funding contained in the Defense Environmental Restoration Account.

- (2) An Alaska Military Toxics Network representative expressed concern about the potential for nuclear materials to have been disposed on the base. He inquired about whether any nuclear materials were known to have been disposed of at Elmendorf and, if so, whether they would be included in the cleanup plan.

USAF Response: There is one site (Source RW17) on Elmendorf AFB, which although not confirmed, was suspected of containing small quantities of low-level radioactive wastes. This site was not suspected of containing weapons materials, but low-level radioactive waste from equipment such as electron tubes and gauges. The site was evaluated; materials were exhumed, removed, and properly disposed of by an off-site contractor; and the site was closed. Following these activities, radioactive analysis using Geiger counters detected no radioactivity above background levels. In 1988, ADEC conducted a RCRA (Resource Conservation and Recovery Act of 1976) facility investigation (RFI) at this source area and prepared an RFI report. The report concluded that no further investigations were presently warranted, since materials had been exhumed and disposed.

REMAINING CONCERNS

Issues and concerns that the Air Force was unable to address during IRA planning activities include the following:

- **What are the specific levels of emissions estimated to be discharged from the air stripper/carbon adsorption unit?** The Air Force has provided preliminary estimates of emissions levels. However, final estimates will not be available until completion of the detailed engineering design of the treatment system has occurred in the fall of 1992.
- **Will continuous monitoring data be available regarding the actual concentrations of air emissions discharged from the carbon adsorption unit?** The Air Force is unable to provide this information currently, since it is dependent on whether ADEC determines the need for modeling or continuous monitoring information for the IRA treatment unit. This decision will be reached during the remedial design phase of the IRA, following development of detailed engineering design data regarding design parameters, volumes of materials to be treated, and flow.
- **Will an outreach program for base personnel be developed to allow input from this segment of the affected community?** The Air Force currently has had insufficient input from persons working or residing on base and interested in the cleanup process to adequately determine the focus of an outreach program for base personnel. In upcoming months, the Air Force plans to conduct activities (e.g., a base survey or a mass mailing to base personnel) to help identify the level of interest in such an outreach program and the specific types of activities that would be most effective for inclusion in this program.

Due to the public's interest in the above topics, the Air Force plans to continue to obtain information necessary to address these concerns. The nature and focus of the base personnel outreach program will be addressed as additional community

relations activities are conducted in association with environmental cleanup activities. Engineering design questions associated with the IRA treatment system will be resolved as sufficient information becomes available during the remedial design phase of the CERCLA process.

It should be noted that all of these concerns relate to information that would become available later in the IRA process for ST41. However, many comments received for the IRA at ST41 related to long-term concerns about the overall extent of contamination. This information, which will become available during the RI/FS phase of OU2 CERCLA studies, will be provided to the public as part of OU2 community relations activities. The public will be notified of the placement of the OU2 RI/FS report in the information repositories. The quarterly newsletter, *Environmental Update*, and/or fact sheets will summarize the results of field investigations and other RI/FS activities, as such information becomes available.

ATTACHMENT A
COMMUNITY RELATIONS ACTIVITIES
AT ELMENDORF AFB

The community relations activities listed below have been conducted to date at Elmendorf AFB in accordance with CERCLA, SARA, and National Contingency Plan requirements.

- In August 1990 and September 1991, community interviews were conducted with local officials, residents of Anchorage and the surrounding area, the media, and representatives of community organizations.
- In early September 1991, an opportunity for base personnel to meet with a community relations consultant was advertised in the Elmendorf AFB newspaper, the *Sourdough Sentinel*.
- In January 1992, the Elmendorf AFB community relations plan was completed based on information obtained during community interviews.
- On January 28, 1992, the date and location of an upcoming public workshop were advertised in the Anchorage *Daily News* and Anchorage *Times*.
- On January 29, 1992, the Air Force issued a press release announcing the public workshop.
- On February 5, 1992, a public workshop was held at the Government Hill Elementary School to discuss environmental cleanup programs at Elmendorf AFB, the CERCLA process, and opportunities for public participation. Approximately 75 individuals attended the workshop.
- On February 5, 1992, information repositories were established at the Bureau of Land Management's Alaska Resources Library, and the University of Alaska at Anchorage's Consortium Library. These repositories contain microfiche copies of the Elmendorf AFB administrative record file and "hard copies" of public information materials (such as newsletters and fact sheets).
- In February 1992, the first issue of *Environmental Update*, a quarterly newsletter aimed at keeping the public informed of the status of environmental cleanup programs at Elmendorf AFB, was distributed to public workshop attendees and individuals on the mailing list.
- In February 1992, a fact sheet was distributed to workshop attendees and individuals on the mailing list. This fact sheet provided detailed descriptions of 53 potentially contaminated sources under investigation at Elmendorf AFB as part of CERCLA and various State of Alaska environmental cleanup programs.
- In February 1992, a fact sheet that described Technical Assistance Grants (TAG), including the basic provisions of the TAG program, eligibility requirements, and the application process, was distributed to workshop attendees and individuals on the mailing list.

- On February 14, 1992, a Proposed Plan fact sheet on the IRA at ST41 was mailed to 240 individuals on the Elmendorf AFB mailing list. Copies of the Proposed Plan were also placed in the information repositories.
- On February 14, 1992, a public notice appeared in the *Sourdough Sentinel*, and on February 16, 1992, public notices appeared in the Anchorage *Daily News* and the Anchorage *Times*. Each notice announced the availability of the Proposed Plan fact sheet, described the preferred alternative, and informed local residents of the upcoming comment period and public meeting on the IRA at Source Area ST41. In addition, the availability of the administrative record file in the site information repositories was announced in each public notice.
- From February 17, 1992 through March 17, 1992, public comments on the IRA at ST41 were received.
- On February 27, 1992, a public meeting on the IRA at ST41 was held at the Z.J. Loussac Library. Approximately 30 residents, members of community organizations, and other interested parties attended. Representatives of the Air Force, EPA, and ADEC were available at the public meeting to answer questions. A verbatim transcript of the meeting was placed in the Elmendorf AFB administrative record file at the information repositories.
- In May 1992, the second issue of *Environmental Update* was distributed to approximately 250 individuals on the mailing list.